

Physiotherapy students' perception of their clinical learning environment and clinician teaching attributes in Nigeria

JN John¹, JA Asogwa¹, OC Okezie¹, DO John², UG Mgbeojedo¹, AO Ezeukwu¹

1. Department of Medical Rehabilitation, Faculty of Health Sciences and Technology, University of Nigeria
2. Department of Physiotherapy, Federal Teaching Hospital, Abakaliki, Ebonyi State, Nigeria

Submitted: 05 July 2021 | Accepted: 28 April 2022 | DOI: [10.14426/opj/a20220428](https://doi.org/10.14426/opj/a20220428)

Abstract

Background: Feedback from students regarding their clinical learning environment and clinicians teaching attributes should be evaluated regularly to monitor students' learning experiences, which can affect learning outcomes, the readiness for professional practice, and the level of satisfaction with the profession. Differences may exist in this feedback from students based on their institution, level of study, and characteristics of the clinicians. **Aim:** To evaluate physiotherapy students' perception of their clinical learning environment and clinicians' teaching attributes. **Methods:** This cross-sectional study utilised 258 participants from two academic institutions, which offer physiotherapy training in southeast Nigeria. A self-structured questionnaire, the McGill Clinical Teacher Evaluation tool (MCGill CTE) and the Dundee Ready Educational Environment Measure (DREEM) were used to collect the data. Descriptive statistics of mean and standard deviation were used to present the mean scores obtained on the DREEM questionnaire and McGill CTE tool. The Mann-Whitney U test was used to determine the difference in the students' perception of their clinical learning environment and clinicians' teaching attributes based on their institution of learning and level of study. In addition, the Mann-Whitney U test also determined the difference in the students' perception of their clinicians teaching attributes based on the clinicians' gender, while the Kruskal Wallis test determined the difference in the students' perception of their clinician's teaching attributes based on their last clinical posting unit and the highest educational level of the clinicians. **Results:** The students perceived their learning environment to be "more positive than negative". The highest-rated domain in the DREEM questionnaire was "perception of learning", while the lowest was "social perception". The highest-rated attribute for clinicians in the McGill CTE tool was "clinical interest in helping students to learn", while the lowest was "emphasises concept rather than factual recall". A significant difference was observed in the students rating of their clinical learning environment based on their institution and level of study. **Conclusion:** There is a need for regular evaluation of students' perception of their clinicians' teaching attributes and the clinical learning environment to ensure the desired learning outcomes are attained and that students are ready for professional practice after training.

Keywords:

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Introduction

Clinical education of students is critical to our future healthcare and is an important aspect of health professions because it plays a fundamental role in shaping the students' approach towards future professional practice (Alsiö et al., 2019; Senthilnathan et al., 2020). Clinical education can only be effective in a conducive learning environment and with clinicians who have good teaching attributes to ensure enhanced learning experiences and outcomes.

In physiotherapy professional training, clinical education involves the assimilation of attitudes, values, and behaviours that define a physiotherapy professional (Delany & Bragge,

2009). Its role in physiotherapy education cannot be overemphasised as it equips students with the competencies, skills, and confidence necessary for clinical practice, thereby enhancing learning outcomes. During this phase of student learning, direct patient care is experienced (Odole et al., 2014). Clinicians who are specialists in the different areas of physiotherapy share their knowledge and professional expertise with the students using innovative teaching methods (Alhaqwi & Taha, 2015). They also give direct supervision in various areas of clinical learning using the best teaching strategies in a good learning environment. Hence, clinical experience is not only an essential element of the health care education programme but it is paramount for the development of good clinical reasoning and professional skills

Corresponding author

JN John: (cynthia.john@unn.edu.ng)

ORCID: <https://orcid.org/0000-0002-7566-3322>

Department of Medical Rehabilitation, Faculty of Health Sciences and Technology, University of Nigeria

in students (Chan, 2004; Benner et al., 2008). The early years of physiotherapy education are focused on basic scientific and medical knowledge, whereas clinical teaching, which primarily comprises of bedside demonstrations, is introduced later in the curriculum (Bench, 1999). Currently, such clinical teaching models are now evolving since medical education is rapidly changing in response to the developments in health care delivery systems (Duncan et al., 2005). Presently in British Commonwealth countries, including Nigeria, the bridge version of physiotherapy clinical education is used, in which students gain their clinical experience in a teaching hospital specifically affiliated with the University (Bench, 1999).

Clinical education is believed to be different from classroom education as it requires key attributes for effective learning including communication, questioning, one-to-one evaluation, and small group skills (Knox & Morgan, 1985). Students engage in supervised learning sessions in health-care settings during clinical education, giving them the opportunity to put what they've learned in the classroom into practice. As a result, the clinical experience acquired by students during the clinical education phase of their programme and the learning outcomes may be grossly influenced by the teaching attributes of the clinical instructor as well as the nature of the student's clinical environment (Knox & Morgan, 1985). Therefore, learning outcomes could be maximised if the clinical experience is impacted by clinical instructors who possess the ideal teaching attributes such as adequate clinical competence, good teaching abilities, professional ethics, substantial clinical experience, and effective communication skills. In addition, the learning environment has a strong impact on students' learning experiences and outcomes (Bakhshialiabad et al., 2015). Thus, an optimal educational environment that provides opportunities for learning experiences that contribute to the achievement of learning objectives, professional socialisation and the quality of care provided to patients during professional practice maximises learning outcomes.

Curricula in programmes that educate future practitioners in health care professions are strongly affected by the requirements of professional associations, regulatory agencies and approval boards. As such, planning and structuring the clinical learning programmes of students in accordance with the overarching curriculum is seldom a linear process. Clinical learning is an important part of the curricula in physiotherapy programmes, as it is in most health-related professions (Bucciari et al., 2013; McCallum et al., 2013). This experience provides context for the application of prior knowledge and the integration of new learning. Students, therefore, have to combine and integrate knowledge, skills, values, and philosophies of the profession that they have learned in the classroom and apply these to the real patient (Demiroren et al., 2008). Clinical learning is therefore an important part of physiotherapy education as it is an integral component of the

curriculum and a silent index of both students' and teachers' behaviour (Demiroren et al., 2008). As such, the student's ability to gain clinical exposure, knowledge and skills which is in line with the stipulated clinical learning standards in the curricula may be influenced by the clinicians teaching attributes and the clinical learning environment. However, obtaining feedback from students regarding their clinician's teaching attributes and their clinical learning environment is vital because it provides a useful basis for modifying and improving the quality of teaching and the suitability of the learning environment, thereby improving learning outcomes. More so, students reportedly play a vital role in curriculum planning (Huppatz, 1996) and can provide feedback on student resources and facilities. Students' involvement and their ideas will enable educators to develop a student-friendly curriculum thereby improving learning outcomes. Consequently, feedback from students could be used as a guide during the curriculum reform process, which entails reviewing and updating the curriculum to prepare students for a fast-changing world and recent healthcare advancements. Several studies have been conducted in various health professions to evaluate clinical students' perceptions of their learning environment and clinician's teaching attributes. Studies have been carried out on medical students' perception of their clinical learning environment (Demiroren et al., 2008; Arzuman et al., 2010; Salminen et al., 2016; Shar et al., 2019). Alammari et al. (2020) carried out a study on nursing students' perception of their clinical learning environment while Wilsom et al. (2021) conducted a study on nursing students' perceived effective clinical teacher behaviours. Physiotherapy students' satisfaction with their clinical learning environment and supervision in the University of Ghana was conducted by Nyante et al. (2020).

However, there are limited studies on physiotherapy students' perception of their clinical learning environment and clinicians' teaching attributes in Nigeria. Two studies were performed in Nigeria, one at the University of Ibadan (Odole et al., 2014) and another at five Nigerian Universities (Oyeyemi et al., 2012). Oyeyemi et al. (2012) evaluated physiotherapy students' perception of their clinicians' teaching attributes while Odole et al. (2014) researched on physiotherapy clinical students' perception of their learning environment. Consequently, there is still a dearth of knowledge on the perception of the clinical learning environment and clinicians' teaching attributes by physiotherapy students in Nigeria, despite the fact that these factors influence the clinical experience and learning outcomes of students. Hence, there is a need for a regular evaluation of students' feedback on the perception of their clinical learning environment and clinicians' teaching attributes as a basis for monitoring, modifying, and improving the quality of teaching and learning to meet the required standards in the curriculum and to improve learning outcomes. In addition, students' opinion on their clinicians' teaching attributes and the clinical learning environment

needs to be constantly evaluated to ensure their learning experience is in line with the requirement of the curriculum, the desired outcome and recent innovations in health care. Therefore, this study evaluated physiotherapy students' perception of their clinical learning environment and clinicians' teaching attributes in Nigeria.

Methods

Design: This study utilised a cross-sectional research design because it is an observational study in which information was obtained from the participants at a particular point in time.

Subject selection: Two hundred and fifty-eight (258) undergraduate physiotherapy students from two universities (University of Nigeria [UNN] and Nnamdi Azikiwe University [NAU]) that offer physiotherapy programmes in south-east Nigeria participated in this study. The inclusion criteria were: fourth and fifth-year students who are in their clinical phase of training and who were available and willing to participate. Convenient sampling technique was used to select the participants.

Instruments for data collection: Section A and B of the questionnaire included self-administered questions which were used to collect information on the socio-demographic characteristics of the participants and clinical instructors, respectively.

The McGill Clinical Teacher Evaluation (CTE) tool was contained in Section C of the questionnaire. This was used to evaluate the physiotherapy students' perception of their clinicians teaching attributes. McGill's CTE instrument is a 25-item tool that has been validated for use among physical therapy clinical instructors (Oyeyemi et al., 2012). This tool uses a 5 point Likert scale: Very strongly agree=5, Agree=4, Unsure = 3, Disagree =2, Very Strongly Disagree=1. Its reliability was evaluated among Nigerian physiotherapy students in a pilot study and a reliability coefficient of 0.73 was obtained (Oyeyemi et al., 2012).

Section D of the questionnaire contained the Dundee ready environment evaluation measure (DREEM). This was used to evaluate the physiotherapy students' perception of their clinical learning environment. It consists of five sub-domains with a total of 50 questions (Miles et al., 2012). The domain on "Students' perception of learning" contains 12 questions, "students' academic self-perception" contains 8 questions, "students' perception of teachers" contains 11 questions, "students' perception of the atmosphere" contains 12 questions and "students' social self-perception" contains 7 questions. The DREEM uses a 5-point scale as follows: Strongly agree = 4, Agree = 3, Unsure = 2, Disagree=1, Very Strongly Disagree= 0. The overall score of the obtained from the DREEM questionnaire is classified as "very poor" for scores between 0 and 50, "plenty of problems" for scores

between 51 and 100, "more positive than negative" for scores between 101 and 150, and "excellent" for scores between 151 and 200 (McAleer & Roff (2001; Askari et al., 2018). A guide for interpreting the domain scores of the DREEM questionnaire was developed by McAleer and Roff (2002). The DREEM has been reported to have a high level of internal consistency with an overall Cronbach's of more than 0.7 (Dimoliatis et al., 2010; Hammond et al., 2012). In addition, this questionnaire has a high level of stability with a test-retest coefficient of more than 0.8 (Dimoliatis et al., 2010).

Procedure: Ethical approval was sought and obtained from the University of Nigeria Teaching Hospital Health Research Ethics Committee (NHREC/05/01/2008B-FWA00002458-IRB00002323). Written informed consent was obtained from the participants prior to data collection. The database of all fourth and fifth-year students was obtained from the various physiotherapy departments of the involved institutions. Text messages and e-mails were sent out to the students inviting them to participate. In addition, further notification was given to the students through their class representatives. All the students who were interested, willing, and available were recruited. All procedures were explained to the participants and confidentiality was assured. The questionnaires were distributed to all the participants who met the selection criteria. The agreement rating on each of the items on the McGill CTE tool was obtained. The overall and domain scores of the DREEM questionnaire were interpreted using the guide by McAleer and Roff (2002).

Data analysis: Descriptive statistics of mean, standard deviation, and percentages were used to present the overall and domain scores of the DREEM questionnaire. The Mann-Whitney U test was used to determine the difference in the students' perception of their clinical learning environment and clinicians' teaching attributes amongst the institution of learning as well as the level of study. In addition, the Mann-Whitney U test was also used to determine the difference in the student's perception of their clinicians' teaching attributes based on the clinicians' gender. The Kruskal Wallis test was used to determine the difference in student's perception of their clinician's teaching attributes based on the last clinical posting unit they attended and the highest educational level of the clinicians. All data were analysed using the statistical package for social science (SPSS version 21.0). Alpha level was set at $p < 0.05$.

Results

Two hundred and ninety-eight (298) questionnaires were distributed for the study. An 87% return rate resulted in 258 questionnaires being completed and returned. Table 1 (see the appendices for all tables) shows the socio-demographic characteristics of the students while Table 2 presents the profile of the clinical instructors.

Clinical learning environment

Based on the overall DREEM scores, the majority of the students (N=189; 73.2%) perceived their learning environment to be "more positive than negative". Out of the remaining, 48 (18.6%) perceived their learning environment to have "plenty of problems", while 21 (8.2%) perceived their learning environment "to be excellent". The mean score of the domains of DREEM showed that the domain on "students' perception of learning" had the highest mean score (30.95 ± 6.52) while the domain on "students' social perception" had the lowest mean score (16.36 ± 5.43). The mean scores of the remaining domains consisted of "students' academic self-perception" (23.86 ± 5.45), "students' perception of teachers" (26.21 ± 6.30) and "students' perception of atmosphere" (24.02 ± 10.38). The mean scores of the domain on "students' perception of learning", "students' academic self-perception", "students' perception of teachers", "students' perception of atmosphere" and "students' social perception" were interpreted as "a more positive perception", "confident", "moving in the right direction", "there are many issues that need changing" and "not too bad" respectively. There was a significant difference in students' perception of the learning environment based on the institution ($p = 0.037$) and the level of study ($p = 0.031$) (Table 3).

Clinicians' teaching attributes

Table 4 presents the rating of the students' perception of their clinicians' teaching attributes using the McGill CTE tool. The clinicians were rated highest in "interested in helping students to learn" with a mean score of 4.25 ± 0.82 and lowest in "emphasises concept rather than factual recall" with a mean score of 3.64 ± 1.05 . There was no significant difference in the students' perception of their clinicians' teaching attributes based on the institution and level of study (Table 5).

There was no significant difference in the students' perception of their clinicians' teaching attributes based on the last unit they attended in clinical posting ($p = 0.806$) (Table 6) and the clinicians' gender ($p = 0.654$) (Table 7). However, the students rated the clinicians in the exercise immunology clinical posting unit higher (mean rank: 187.33) than the clinicians in other postings units. Students also rated their male clinicians higher than their female counterparts (mean rank: 125.20).

There was no significant difference in the students' perception of their clinicians' teaching attributes based on the clinicians' highest educational qualification ($p = 0.533$) (Table 8). Clinicians with a Master of Science (M.Sc) degree were rated higher (mean rank: 130.48) than clinicians with a Bachelor of Science (B.Sc) degree (mean rank: 116.56), while those with a Doctor of Philosophy (Ph.D) had the lowest rating (mean rank: 114.36).

Discussion

Clinical learning environment

The results showed that the majority of the students indicated that their learning environment was "more positive than negative". This finding was supported by several other studies who observed a "more positive than negative" learning environment among the students using the DREEM questionnaire (Demiroren et al., 2008; Odole et al., 2014; Pai et al., 2014). Though the learning environment in the current study was rated as "excellent" by only few students, the positive findings which were observed among the majority in the current study and previous studies could be linked to the health sector's constant advancements due to regular hospital accreditation programmes in which hospital facilities and their level of performance are assessed in relation to established standards (Greenfield et al., 2012; Hinchcliff et al., 2012). This puts every department under pressure to meet the required standards, thereby resulting in a conducive clinical learning environment for students. The higher scores observed in the domain on "student perception of learning" corroborates the findings of some previous studies (Demiroren et al., 2008; Odole et al., 2014; Pai et al., 2014) who also reported higher scores in this domain compared to other domains in the DREEM questionnaire.

Moreover, in the current study, the scores reported in the domain of "student perception of learning" which is interpreted as a "more positive perception" using the guide by McAler and Roff (2002), corroborates the findings of previous studies (Demiroren et al., 2008; Odole et al., 2014; Pai et al., 2014). This indicates that the students in the current study also had positive perceptions about their learning experiences, even though the rating of the scores for their learning experiences was second to the highest using the guide by McAler and Roff (2002). The scores of the domain on "student perception of teachers" in the current study were interpreted as "moving in the right direction". Previous studies (Demiroren et al., 2008; Odole et al., 2014; Pai et al., 2014) also interpreted the scores on "students' perception of teachers" as moving in the right direction. However, though the students indicated that their teachers were "moving in the right direction" in the current and previous studies, they didn't rate their teachers as "model course organisers" which is the interpretation for higher scores in this domain. In the domain of "student academic self-perception" in the current study, scores were interpreted as "confident". On the contrary, the "student's academic self-perception" scores in the study by Demiroren (2008), Odole et al. (2014) and Pai et al. (2014) were interpreted as "feeling more on the positive side."

Despite the fact that teachers of the students in the current study were not rated highest, the students still had the highest rating based on their academic self-perception. This could be

related to their participation in tutorial classes which is a small group teaching in which students are actively involved in the learning process and take responsibility for their own learning. Participation of students in tutorial class is a strategy that is increasingly being adopted by many medical schools and other disciplines (Mir et al., 2019), due to the challenge of increasing student numbers, as well as the teacher-centered teaching approach and didactic teaching style which teachers now adopt to convey large amounts of information to a large number of students (deJong et al., 2010). Thus, these tutorial classes provide a dynamic and more collaborative approach to learning which positively influences a student's academic performance.

The interpretation of the scores on "students perception of the atmosphere" was "there are many issues that need changing". On the contrary, the interpretation of the scores of this domain in the study by Demiroreen et al. (2008), Odole et al. (2014) and Pia et al. (2014) was "a more positive atmosphere". This indicates that in the current study, the students perceived their atmosphere to have a wide range of problems. Judging from the items in this domain of the questionnaire, the problems in the students atmosphere ranged from the relaxation of the atmosphere during clinical teaching, lectures and seminars/tutorials; structure of the school time table, cheating, development of interpersonal skills, feeling comfortable in class socially, finding the teaching experience disappointing, ability to concentrate, enjoyment outweighing the stress of the course, motivation of the atmosphere and irritation of the students by the teachers. It has been reported that a clinical environment can only be suitable for effective learning when it is well planned and organised (Spencer, 2003).

In addition, it has been documented that the perceived atmosphere accurately depicts the real-life educational environment of students (Jiffry et al., 2005). Hence, this indicates that the "students perception of atmosphere" in the current study did not reflect that they had an ideal atmosphere in their educational environment. In the domain of "students' social perception", in the current study, scores were interpreted as "not too bad". Similarly, the study by Demiroreen et al. (2008), Odole et al. (2014) and Pai et al. (2014) interpreted the "students' social perception" score as "not too bad". However, though the scores in the domain on "students' social perception" in the current and previous studies were "not too bad", the observed scores didn't attain higher scores in this domain which is rated as "very good socially". It has been reported that an educational environment that is not favourable to learning not only hinders learners' ability to acquire new knowledge but has a negative impact on their social lives and community contributions (Audin et al., 2003). Therefore this indicates that the nature of the students' clinical environment in this study could have affected their social lives.

Although the students in the current study perceived their learning environment to have more positive features, a significant difference was observed between the two institutions (UNN and NAU) in the rating of their clinical environment. Students in NAU had higher mean scores than students in UNN in the rating of their clinical environment. This may be attributed to the slight differences in the curriculum between the two institutions. In the course of this study, the researchers discovered that NAU's curriculum is structured in such a way that students regularly undergo Student Industrial Work Experience Scheme (SIWES) postings which allow them to visit other teaching hospitals or special homes that provide physiotherapy services outside their state. Unfortunately, this is not obtainable in UNN where students attend SIWES postings occasionally and do their clinical rotations predominantly in hospitals within their state, thereby making the students only conversant with clinical environments in their area.

More so, the students in the current study had significant differences in the perceptions of their learning environment based on their level of study. Despite the fact that the transition between the theoretical and the clinical phase is reportedly the most stressful period of undergraduate medical education (Morrison & Moffat, 2001; Radcliffe & Lester, 2003), the fourth-year students had higher mean scores in the rating of their clinical environment than the fifth-year students in the current study. This supports the findings of a study carried out by Riquelme et al. (2009) to evaluate students' perceptions of their educational environment. Their study reported that fifth-year students had lower scores in the subscales of the DREEM questionnaire compared to students in other levels of study. Hence, these findings are not surprising given that students in their third and fourth years of study have a greater desire to learn and explore new ground as they transition from the preclinical to the clinical phase of training.

Furthermore, though transiting from preclinical to clinical training has been reported as an exciting phase of learning for students due to changes in context and responsibilities (Artherley et al., 2019; Morrison & Moffat, 2001), it has been described as a challenging process (Malau-Aduli, 2020). Students who have recently moved from preclinical to clinical training may be unfamiliar with the system. In most cases, adequate support is provided from institutions in terms of transportation and clinical orientation programmes so as to get these students acquainted with the environment and ensure a smooth transition. Thus, the perception of the learning environment tends to decrease as the students advance in their years of study when they get more familiar with the clinical environment. On the other hand, these findings contradict the finding of the study by Till et al. (2004) in which fourth-year students rated their clinical environment lower than their final years. They reported in their study that students in their fourth year required more assistance in

transiting from the preclinical to the clinical year of study but had inadequate support from their institution. However, these reports indicate that adequate support from institutions to the students transitioning from the pre-clinical to the clinical phase of training may improve the students' perception of their learning environment and thereby improve learning outcomes.

Clinicians' teaching attributes

It was observed among the students in this study that "clinicians' interest in helping students to learn" had the highest rating based on the McGills CTE tool, while "emphasising concepts rather than factual recall" had the lowest rating. This is in agreement with the findings of Oyeyemi et al. (2012). In their study, they also reported that the "clinicians' interest in helping students learn" had the highest rating amongst physiotherapy students in Nigeria. On the contrary, Oyeyemi et al. (2012) reported that students rated "challenging points presented in text and journals" lowest. Clinical instructors are critical to the success of medical students' training. A study carried out by Dahlstrom (2005) found that clinicians are motivated to teach medical students because of the desire to help students become good health professionals. Most clinicians in their study were motivated to teach because of inspiration from senior mentors, their involvement in the development of upcoming health professionals and the opportunity to highlight an area of specialty. These reasons, as indicated in prior research, may not be different from the reason why clinicians in the current study had a high rating in "clinicians' interest in helping students to learn." Though addressing clinical problems necessitates a thorough understanding of the underlying factual knowledge that is unique to the situation (Taveira-Gomes et al., 2015), studies have shown that concept-based learning has the potential to support the integration of theory with practice and clinical judgement through the application experiences (Nilsen, 2016). Regardless, clinicians in the current study had the lowest rating for "emphasising concepts rather than factual recall," which could affect student learning outcomes.

There was no significant difference in students' perception of their clinician's teaching attributes based on their institution and level of study in the current study. However, students from NAU rated their clinicians higher than UNN students. This may have been noted among NAU students because of the wide range of contact with different clinicians in different specialties in various hospital settings during their SIWES programme. As a result of their interactions with these clinicians, these students also may have been exposed to a variety of clinical cases, thereby leading to a higher rating of their clinicians. The reports of a previous study stated that exposing students to a variety of clinical cases can help them learn more effectively (Lofmark et al., 2001). Another previous study reported that exposure of students to high

experiences which are associated with proper feedback is positively associated with their performance in end rotation clinical examinations (Chateenany, 1996). Thus, apart from enhanced learning and performance, students exposure to a wide range of experiences could positively affect the ratings of their clinicians.

The fifth-year students rated their clinicians higher than the fourth-year students in the current study. This may be attributed to the increased number of contact which the fifth-year students had with their clinicians as well as the higher level of clinical exposure which they had attained in several clinical posting units compared to the fourth-year students. This is not surprising considering that the school curriculum is designed to support students' development such that as they get to their final year they have acquired sufficient knowledge, clinical and professional skills, and are ready to assume appropriate responsibility immediately after graduation (Alansari, 2014; "Education World Federation for Medical Education [WFME]," 2015).

The results of the current study also showed that students had a higher rating of exercise-immunology clinicians followed by those in the neurology unit. This could be attributed to the fact that this clinical posting unit was recently established as a sole unit in the physiotherapy departments of these two institutions. As a result, clinicians in this unit may devote more time and effort to endearing students to this area of physiotherapy. The students also had a higher rating of male clinicians compared to females though there was no significant difference in the students ratings of their clinical instructors' based on the instructors gender. Likewise in previous studies, though in other medical professions, students rated their male instructors higher. Male physicians were rated higher on trustworthiness, competence, and professionalism compared to female physicians in a study by Ladha (2017). In addition, Morgan et al. (2016) and Fasiotto et al. (2018) observed that female instructors were rated lower than males by medical students and residents respectively. Therefore, there seems to be gender bias in students' rating of their instructors.

In addition, in the current study, clinicians with an MSc degree had the highest rating followed by clinicians with BSc degrees and then those with Ph.D. Clinicians with M.Sc. degrees may have had more up-to-date knowledge, skills, clinical competence, and enthusiasm for instruction than those with B.Sc. degree, which might explain why this occurred. These traits have previously been noted as important characteristics of a good and effective clinical instructor (Jahan et al., 2008; Sutkin et al., 2008). Also, clinicians with Ph.D. degrees were perhaps rated lowest because clinical students may have had lesser contact with them because most of them are in charge of clinical posting units and are not always available to students.

Conclusion

The majority of the students indicated that their learning environment was "more positive than negative" and the students rated their clinicians higher in "clinical interest in helping students to learn". A significant difference was observed in the students' perception of their learning environment based on the institution and the level of study. There was no significant difference in the students' perception of their clinicians' teaching attributes based on the institution, level of study, the student's last unit in clinical posting, clinical instructors' gender and highest educational qualification. Regular evaluation of the students' perception of their clinicians' teaching attributes and clinical learning environment should be advocated. This can form the basis for the investigation of the quality of teaching and the nature of the clinical environment to ensure the desired learning outcomes are attained and that students are ready for professional practice after training. In addition, this could aid educational administrators in recognising underlying problems that limit medical students' learning experiences, thereby increasing the quality of medical education and clinical care.

A unified curriculum for students' clinical posting experience could be developed, outlining the clinical learning standards and the students' learning outcomes so as to ensure uniformity in students' clinical exposure. This should form part of the requirement for accreditation of clinical departments. Seminars and workshops on clinical skill acquisition should be regularly organised for clinicians in the health sector to sensitise and keep them informed on the latest advances in health care and in clinical teaching. This will enable students to have better learning outcomes.

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Appendices

Table 1: Socio-demographic characteristics of the participants.

Variables	N	%
University		
University of Nigeria	107	41.5
Nnamdi Azikiwe University	151	58.5
Age		
Younger than 16	0	0
16-20	39	15
21-25	165	64
26-30	50	19.4
Older than 30	4	1.6
Year of study		
4 th year	145	56.2
5 th year	113	43.8
Gender		
Male	105	40.6
Female	153	59.4
Last unit attended in clinical posting		
Neurology	65	25.2
Orthopaedics	49	18.9
Intensive Care Unit	31	12.1
Obstetrics and Gynaecology	28	10.8
Paediatrics	21	8.2
Sports	3	1.2
Exercise Immunology	6	2.4
Medicine	33	12.7
Electrotherapy	22	8.5

Table 2: Profile of clinical instructors.

Variables	N	%
Gender		
Male	149	57.8
Female	106	42.2
Highest Educational level		
B.Sc.	46	17.8
M.Sc.	65	25.3
Ph.D.	35	13.5
Unknown	112	43.4
Speciality of clinical instructor		
Neurology	64	24.8
Orthopaedics	62	24
Cardiopulmonary	53	20.5
Obstetrics and Gynaecology	33	12.7
Paediatrics	22	8.6
Sports	3	1.2
Others	21	8.2

Table 3: Mann-Whitney comparison of rating of students' perception of learning environment based on institution and level of study of participants (* significant at $p < 0.05$).

	N	Mean Rank	Z	p-value
Institution				
University of Nigeria	107	114.94	-2.081	0.037*
Nnamdi Azikiwe University	151	134.22		
Level of Study				
4 th year	143	133.81	-2.152	0.031*
5 th year	115	114.05		

Table 4: Order of rating of students' perception of their clinicians teaching attributes using the McGill Questionnaire (Key: X=Mean, SD= Standard deviation).

Attributes	X	SD
My clinician is :		
Interested in helping students to learn	4.25	0.82
Emphasises problem-solving approach rather than solution per se	4.13	0.80
Encourages students to ask questions	4.07	0.90
Deals with colleagues and staff members in a friendly manner	4.01	0.83
Encourages students to think	4.00	0.97
Dependability of attendance is good	4.00	0.84
Provides feedback and direction to students	3.95	0.93
Encourages students to take responsibility of their own learning	3.93	0.83
Is enthusiastic and understanding	3.92	2.81
Inspires confidence in his/her knowledge of the subject	3.90	1.05
Provides opportunities for discussion with students	3.88	1.05
Display good judgments in decision-making	3.88	0.96
Emphasises clinical skills, not lab test for patient management	3.88	0.95
Presents divergent viewpoints for contrast and comparison	3.87	1.00
Is usually readily available for discussion	3.85	1.01
Attitudes to patients fit my concept of professional	3.84	1.03
Invites comments rather than providing all answers	3.83	1.10
Conveys enjoyment of associating with and his/her colleague	3.82	0.92
Is clear and understanding in his/her explanation	3.79	0.93
Is usually well-prepared for teaching sessions	3.76	1.02
Teaching is suited to the level of student sophistication	3.76	1.01
Poses problem for students to solve	3.75	1.07
Is interested in the social and psychological aspects of illness	3.72	1.05
Occasionally challenging points presented in texts and journals	3.66	1.00
Emphasises concept rather than factual recall	3.64	1.05

Table 5: Mann-Whitney comparison of students' perception of their clinicians' teaching attributes based on their institution and level of study.

	N	Mean Rank	Z	p value
Institution				
University of Nigeria	107	122.88	-0.587	0.558
Nnamdi Azikiwe University	151	128.32		
Level of Study				
4 th Year	143	121.60	-0.831	0.406
5 th Year	115	129.23		

Table 6: Kruskal Wallis comparison of students' perception of their clinicians' teaching attributes based on the last unit they attended in clinical posting.

	N	Mean Rank	Chi-square	p-value
Neurology	73	144.12	21.37	0.806
Orthopaedics	49	115.61		
Intensive Care Unit	31	112.84		
Obstetrics and Gynaecology	28	123.75		
Paediatrics	16	68.78		
Sports	3	97.00		
Exercise Immunology	6	187.33		
Medicine	33	130.32		
Electrotherapy	19	134.89		

Table 7: Mann-Whitney comparison of physiotherapy student's perception of their clinicians' teaching attributes based on the clinicians' gender.

Gender	N	Mean Rank	Z	p-value
Male	149	125.20	-0.448	0.654
Female	106	121.06		

Table 8: Kruskal Wallis' comparison of student's perception of their clinicians' teaching attributes based on the clinicians' highest level of education.

Highest educational qualification	N	Mean Rank	Chi-square	p-value
B.Sc.	44	116.56	2.195	0.533
M.Sc.	61	130.48		
Ph.D.	35	114.36		
Unknown	110	129.86		

Conflict of interest

The authors declare that there is no conflict of interest.

Peer review reports

Tammy Pretorius (tawilliams@uwc.ac.za)

Reviewed: 20 October 2021

Citation: Pretorius, T. (2021). Physiotherapy students' perception of their clinical learning environment and clinician teaching attributes in Nigeria. OpenPhysio. DOI: [10.14426/opj/rtp20211020](https://doi.org/10.14426/opj/rtp20211020)

Michael Rowe (mrowe@lincoln.ac.uk)

Reviewed: 03 February 2022

Citation: Rowe, M. (2022). Physiotherapy students' perception of their clinical learning environment and clinician teaching attributes in Nigeria, OpenPhysio. DOI: [10.14426/opj/rmr20220203](https://doi.org/10.14426/opj/rmr20220203)